CLAIMS (AMENDED)

1. (Amended) A light dispersion filter for applying desired dispersion to an incident optical signal, comprising:

three or more optically transparent layers each having a value equal to the value of a product of a refractive index and a thickness of said optically transparent layer, and transmitting light; and

a plurality of partially reflective layers having predetermined reflectivities, and arranged alternately with said optically transparent layers,

wherein the reflectivity is highest on a partially reflective layer disposed near the center of said light dispersion filter in a direction of thickness of said light dispersion filter, and the reflectivities of the respective partially reflective layers are gradually lower toward both end faces of said light dispersion filter.

2. A light dispersion filter for applying desired dispersion to an incident optical signal, comprising:

a plurality of etalon resonators, each including:

an optically transparent layer having an equal value of a product of a refractive index and a thickness, and transmitting light; and

partially reflective layers having predetermined reflectivities, and bonded to two surfaces of said optically transparent layer, respectively,

wherein said etalon resonators are arranged in series such that the value of the product of the refractive index of air and an interval of said etalon resonators is equal to the value of the product of the refractive index and thickness of said optically transparent layer.

3. (Amended) The light dispersion filter according to claim 2, wherein the reflectivity is the highest on a partially reflective layer disposed near a center of said light dispersion filter in a direction of thickness of said light dispersion filter, and the reflectivities of the respective partially reflective layers are gradually lower toward both end faces of said light dispersion filter.

4. (Amended) The light dispersion filter according to claim 1, further comprising a reflective mirror for completely reflecting light, said reflective mirror being disposed at a location at which the value of a product of a distance to a light exit plane and the refractive index of a material between said exit plane and said reflective mirror is one-half of a product of the refractive index and thickness of said optically transparent layer.

5. (Amended) The light dispersion filter according to claim 3, further comprising a reflective mirror for completely reflecting light, said reflective mirror being disposed at a location at which the value of a product of a distance to a light exit plane and the refractive index of a material between said exit plane and said reflective mirror is one-half of a product of the refractive index and thickness of said optically transparent layer.

6. (Amended) A light dispersion filter for applying desired dispersion to an incident optical signal, comprising:

three or more optically transparent layers each having a value equal to the value of the product of a refractive index and a thickness of said optically transparent layer, and transmitting light; and

a plurality of partially reflective layers having predetermined

reflectivities, and arranged alternately with said optically transparent layers,

wherein the reflectivities of said partially reflective layers are gradually higher from a light incident plane side for said light dispersion filter to a last end face on the opposite side to said incident plane.

7. (Amended) The light dispersion filter according to claim 2, wherein the reflectivities of said partially reflective layers are gradually higher from a light incident plane side for said light dispersion filter to a last end face on the opposite side to said incident plane.

8. (Amended) The light dispersion filter according to claim 1, wherein:

said optically transparent layer is a dielectric substrate; and

said partially reflective layer is a thin film or a multi-layered film composed of a plurality of laminated thin films.

9. (Amended) The light dispersion filter according to claim 2, wherein:

said optically transparent layer is a dielectric substrate; and

said partially reflective layer is a thin film or a multi-layered film composed of a plurality of laminated thin films.

10. (Amended) The light dispersion filter according to claim 6, wherein:

said optically transparent layer is a dielectric substrate; and

said partially reflective layer is a thin film or a multi-layered film composed of a plurality of laminated thin films.

11. The light dispersion filter according to claim 1, wherein:

said optically transparent layer is a semiconductor substrate; and

said light dispersion filter comprises light amplifying means in said semiconductor substrate for amplifying an incident optical signal.

12. The light dispersion filter according to claim 2, wherein:

said optically transparent layer is a semiconductor substrate; and

said light dispersion filter comprises light amplifying means in said semiconductor substrate for amplifying an incident optical signal.

13. (Amended) The light dispersion filter according to claim 6, wherein:

said optically transparent layer is a semiconductor substrate; and

said light dispersion filter comprises light amplifying means in said semiconductor substrate for amplifying an incident optical signal.

14. (Amended) The light dispersion filter according to claim 1, wherein said optically transparent layers and said partially reflective layers are bonded by an adhesive having the same refractive index as said optically transparent layers.

15. (Amended) The light dispersion filter according to claim 2, wherein said optically transparent layers and said partially reflective layers are bonded by an adhesive having the same refractive index as said optically transparent layers.

16. (Amended) The light dispersion filter according to claim 6, wherein said optically transparent layers and said partially reflective layers are bonded

by an adhesive having the same refractive index as said optically transparent layers.

17. (Amended) An optical module comprising:

an optical active element for use in optical communications;

an optical fiber serving as an optical signal transmission medium; and

a transmission type light dispersion filter disposed on an optical axis connecting said optical active element to said optical fiber for compensating for dispersion in said optical fiber.

18. (Amended) An optical module comprising:

an optical active element for use in optical communications;

an optical connector for removably fixing an optical fiber serving as an optical signal transmission medium; and

a transmission type light dispersion filter disposed on an optical axis connecting said optical active element to said optical fiber for compensating for dispersion in said optical fiber.

19. (Amended) An optical module comprising:

an optical fiber serving as an optical signal transmission medium;

a reflection type light dispersion filter for compensating for dispersion in said optical fiber; and

an optical active element disposed at a location deviated from an optical axis connecting said optical fiber to said light dispersion filter, for use in optical communications.

20. (Amended) An optical module comprising:

an optical connector for removably fixing an optical fiber serving as an optical signal transmission medium;

a reflection type light dispersion filter for compensating for dispersion given in said optical fiber; and

an optical active element disposed at a location deviated from an optical axis connecting said optical fiber to said light dispersion filter, said optical active element being for use in optical communications.

21. (Amended) The optical module according to claim 19, further comprising:

a half mirror positioned on the optical axis connecting said optical fiber to said light dispersion filter,

wherein said optical active element is disposed on an optical axis of light reflected from said half mirror.

22. (Amended) The optical module according to claim 20, further comprising:

a half mirror positioned on the optical axis connecting said optical fiber to said light dispersion filter,

wherein said optical active element is disposed on an optical axis of light reflected from said half mirror.

23. (Amended) The optical module according to claim 17, further comprising:

a first temperature controller for controlling the temperature of said

optical active element; and

a second temperature controller for controlling the temperature of said light dispersion filter.

24. (Amended) The optical module according to claim 18, further comprising:

a first temperature controller for controlling the temperature of said optical active element; and

a second temperature controller for controlling the temperature of said light dispersion filter.

25. (Amended) The optical module according to claim 19, further comprising:

a first temperature controller for controlling the temperature of said optical active element; and

a second temperature controller for controlling the temperature of said light dispersion filter.

26. (Amended) The optical module according to claim 20, further comprising:

a first temperature controller for controlling the temperature of said optical active element; and

a second temperature controller for controlling the temperature of said light dispersion filter.

27. (Amended) The optical module according to claim 17, wherein said

optical active element is a light source for emitting an optical signal.

28. (Amended) The optical module according to claim 18, wherein said optical active element is a light source for emitting an optical signal.

29. (Amended) The optical module according to claim 19, wherein said optical active element is a light source for emitting an optical signal.

30. (Amended) The optical module according to claim 20, wherein said optical active element is a light source for emitting an optical signal.

31. (Amended) The optical module according to claim 17, wherein said optical active element is a light receiving element for receiving an optical signal.

32. (Amended) The optical module according to claim 18, wherein said optical active element is a light receiving element for receiving an optical signal.

33. (Amended) The optical module according to claim 19, wherein said optical active element is a light receiving element for receiving an optical signal.

34. (Amended) The optical module according to claim 20, wherein said optical active element is a light receiving element for receiving an optical signal.

35. (Amended) A light dispersion measuring device comprising:

an optical demultiplexer for branching an optical signal;

the light dispersion filter according to claim 1, through which one of the optical signals branched by said optical demultiplexer passes;

a first light receiver for generating an electric signal corresponding to the optical signal which has passed through said light dispersion filter;

a second light receiver for generating an electric signal corresponding to another optical signal branched by said optical demultiplexer; and

a signal differential circuit for generating a difference between the signals generated from said first light receiver and said second light receiver.

36. (Added) A light dispersion measuring device comprising:

an optical demultiplexer for branching an optical signal;

the light dispersion filter according to claim 2, through which one of the optical signals branched by said optical demultiplexer passes;

a first light receiver for generating an electric signal corresponding to the optical signal which has passed through said light dispersion filter;

a second light receiver for generating an electric signal corresponding to another optical signal branched by said optical demultiplexer; and

a signal differential circuit for generating a difference between the signals generated from said first light receiver and said second light receiver.

37. (Added) A light dispersion measuring device comprising:

an optical demultiplexer for branching an optical signal;

the light dispersion filter according to claim 6, through which one of the optical signals branched by said optical demultiplexer passes;

a first light receiver for generating an electric signal corresponding to the optical signal which has passed through said light dispersion filter;

a second light receiver for generating an electric signal corresponding to another optical signal branched by said optical demultiplexer; and

a signal differential circuit for generating a difference between the signals generated from said first light receiver and said second light receiver.

38. (Added) A communication channel extracting apparatus comprising a light dispersion filter through which optical signals on a plurality of communication channels set at predetermined frequency intervals pass, said light dispersion filter having a free spectral range set wider than the frequency interval.

39. (Added) The communication channel extracting apparatus according to claim 38, further comprising a temperature controller for controlling the temperature of said light dispersion filter.